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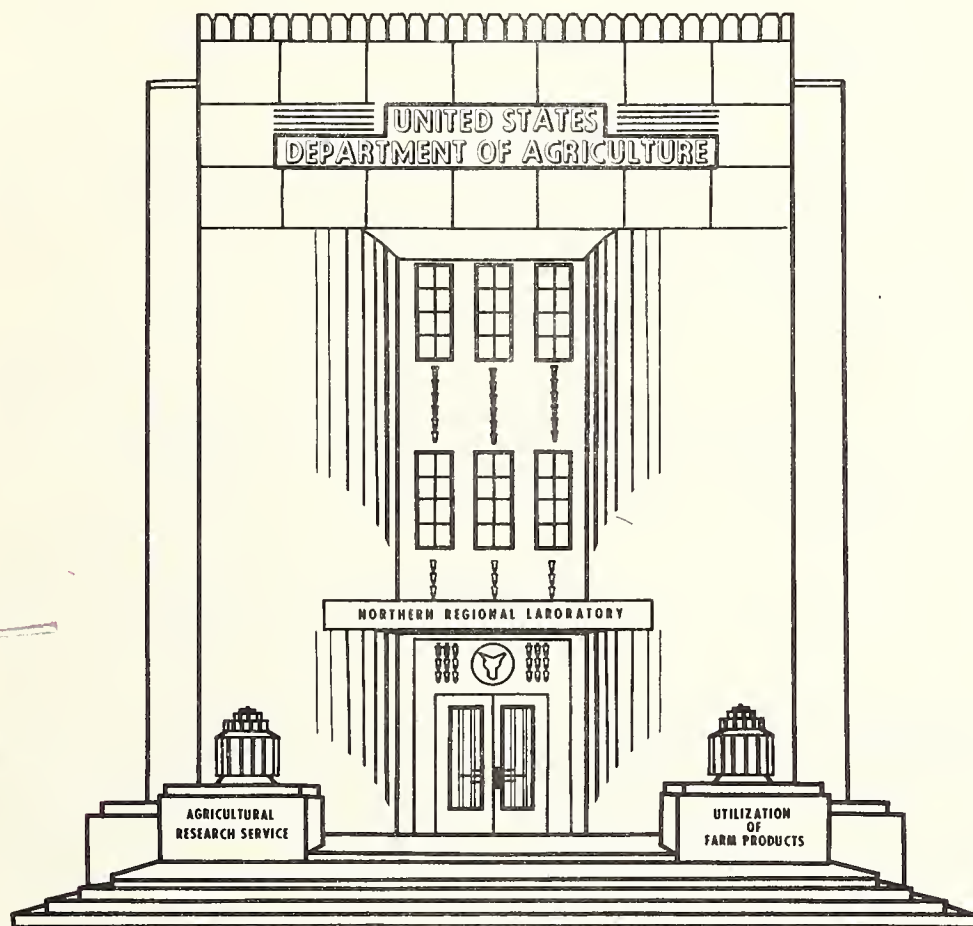
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## INDUSTRIAL USES OF PROTEINS

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A List of Publications and Patents, 1936-1961  
Northern Regional Research Laboratory



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This list of publications and patents represents 25 years of research work on industrial uses of proteins and related technology. It supersedes previous lists issued as AIC-184 Suppl. 1-6; AIC-228, Suppl. 1-6; and ARS-71-5, Suppl. 1-7. References are listed chronologically, except those pertaining to subgroups under a main heading are placed together.

Northern Utilization Research and Development Division  
1815 North University Street  
Peoria, Illinois

PUBLICATIONS ON INDUSTRIAL USES OF PROTEINS

1936-1961

[Publications marked (\*) are not available for distribution.  
When requesting specific reprints, please order by number.]

Amino Acids and Proteins

- 431 \* CYANOETHYLATION OF ALPHA AMINO ACIDS.  
I. MONOCYANOETHYL DERIVATIVES.  
L. L. McKinney, E. H. Uhing, E. A. Setzkorn,  
and J. C. Cowan.  
J. Am. Chem. Soc. 72(6): 2599-2603. June 1950.
- 480 \* CYANOETHYLATION OF  $\alpha$ -AMINO ACIDS.  
II. DICYANOETHYL AND TRICYANOETHYL DERIVATIVES.  
L. L. McKinney, E. H. Uhing, E. A. Setzkorn,  
and J. C. Cowan.  
J. Am. Chem. Soc. 73(4): 1641-1644. April 1951.
- 581 CYANOETHYLATION OF  $\alpha$ -AMINO ACIDS.  
III. HYDROLYSIS OF CYANOETHYL DERIVATIVES.  
L. L. McKinney, E. A. Setzkorn, and E. H. Uhing.  
J. Am. Chem. Soc. 74(8): 1942-1943. April 1952.
- 627 CYANOETHYLATION OF  $\alpha$ -AMINO ACIDS.  
IV. N-2-CARBALKOXYETHYL DERIVATIVES.  
L. L. McKinney, E. H. Uhing, E. A. Setzkorn,  
and J. C. Cowan.  
J. Am. Chem. Soc. 74(20): 5183-5185. October 1952.
- 33-SBL \* THE DISPERSION OF PROTEIN IN AQUEOUS FORMALDEHYDE  
SOLUTIONS.  
Allan K. Smith, Herbert J. Max, and Philip Handler.<sup>1</sup>  
J. Phys. Chem. 43(3): 347-357. March 1939.

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<sup>1</sup> U.S. Regional Soybean Industrial Products Laboratory,  
Urbana, Ill. The chemical and engineering investigations  
conducted at this Laboratory were transferred to the  
Northern Laboratory as of July 1, 1942.

- 63-SBL \* SOYBEAN PROTEIN DISPERSIONS IN FORMALDEHYDE SOLUTIONS.  
PREPARATION AND APPLICATION.  
Allan K. Smith and Herbert J. Max.<sup>1</sup>  
Ind. Eng. Chem. 32(3): 411-415. March 1940.
- 58-SBL \* THE REACTION OF FORMALDEHYDE WITH AMINO ACIDS:  
X-RAY DIFFRACTION PATTERNS.  
Allan K. Smith,<sup>1</sup> Philip Handler,<sup>1</sup> and J. N. Mrgudich.<sup>2</sup>  
J. Phys. Chem. 44(7): 874-880. October 1940.
- 75-SBL \* THE EFFECT OF FORMALDEHYDE ON THE ISOELECTRIC POINTS  
OF SOME PROTEINS, DETERMINED BY MICROELECTROPHORESIS.  
Sidney J. Circle and Allan K. Smith.<sup>1</sup>  
J. Phys. Chem. 45(6): 916-930. June 1941.
- 1030 CARBOXYMETHYLATED SOYBEAN PROTEIN.  
L. L. McKinney and E. H. Uhing.  
J. Am. Oil Chemists' Soc. 36(2): 49-51.  
February 1959.

#### Plastics and Adhesives

- 19-SBL \* PROTEIN PLASTICS FROM SOYBEAN PRODUCTS: RELATION  
OF WATER CONTENT TO PLASTIC PROPERTIES.  
A. C. Beckel, G. H. Brother, and L. L. McKinney.<sup>1</sup>  
Ind. Eng. Chem. 30(4): 436-440. April 1938.
- 20-SBL \* PROTEIN PLASTICS FROM SOYBEAN PRODUCTS: ACTION OF  
HARDENING OR TANNING AGENTS ON PROTEIN MATERIAL.  
George H. Brother and Leonard L. McKinney.<sup>1</sup>  
Ind. Eng. Chem. 30(11): 1236-1240. November 1938.
- 35-SBL \* PROTEIN PLASTICS FROM SOYBEAN PRODUCTS: PLASTICIZATION  
OF HARDENED PROTEIN MATERIAL.  
George H. Brother and Leonard L. McKinney.<sup>1</sup>  
Ind. Eng. Chem. 31(1): 84-87. January 1939.
- 34-SBL \* PLASTIC MATERIALS FROM FARM PRODUCTS.  
George H. Brother.<sup>1</sup>  
Ind. Eng. Chem. 31(2): 145-148. February 1939.  
RSLM=34. 1939. 9 pp. [Processed]

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<sup>2</sup> University of Illinois, Urbana.



- 31-SBL \* CASEIN PLASTICS.  
George H. Brother.<sup>1</sup>  
In Casein and Its Industrial Applications. 2nd ed.  
Edwin Sutermeister and Frederick L. Browne, eds.  
Chap. 7, pp. 181-232. New York. 1939.
- 43-SBL \* CASEIN PLASTICS.  
George H. Brother.<sup>1</sup>  
Ind. Eng. Chem. 32(1): 31-33. January 1940.
- 54-SBL \* PROTEIN PLASTICS FROM SOYBEAN PRODUCTS. INFLUENCE  
OF PHENOLIC RESINS OR PHENOLIC MOLDING COMPOUNDS ON  
FORMALDEHYDE-HARDENED PROTEIN MATERIAL.  
George H. Brother and Leonard L. McKinney.<sup>1</sup>  
Ind. Eng. Chem. 32(7): 1002-1006. July 1940.
- 55-SBL \* PROTEIN PLASTICS FROM SOYBEAN PRODUCTS.  
LAMINATED MATERIAL.  
George H. Brother, Leonard L. McKinney,  
and W. Carter Suttle.<sup>1</sup>  
Ind. Eng. Chem. 32(12): 1648-1651. December 1940.
- 49-SBL \* THE DEVELOPMENT OF SOYBEAN-PHENOLIC MOULDING PLASTICS.  
George H. Brother and Leonard L. McKinney.<sup>1</sup>  
Plastics 4: 93-95. April 1940.
- 82-SBL \* A SIMPLE FLEXURE-TESTING MACHINE FOR PLASTICS.  
G. H. Brother, W. C. Suttle, and L. L. McKinney.<sup>1</sup>  
ASTM Bull. No. 109, pp. 13-16. March 1941.
- 83-SBL \* SOYBEANS IN PLASTICS. FLOW PROPERTIES OF A PHENOLIC  
PLASTIC MODIFIED WITH FORMALDEHYDE-HARDENED SOYBEAN MEAL.  
L. L. McKinney and G. H. Brother.<sup>1</sup>  
Mod. Plastics 18(9): 69-71. May 1941.
- 101-SBL \* SOY MEAL IN PLASTICS.  
Leonard L. McKinney.<sup>1</sup>  
Soybean Dig. 2(8): 4-5, 11. June 1942.  
ACE-151 (RSLM-63). 1942. 4 pp. [Processed]
- 38 \* SOYBEAN-MODIFIED PHENOLIC PLASTICS.  
L. L. McKinney, Rudolph Deanin, Glen Babcock,  
and A. K. Smith.  
Ind. Eng. Chem. 35(8): 905-908. August 1943.
- 225 \* UTILIZATION OF SOYBEAN MEAL IN MOLDED PLASTICS.  
Leonard L. McKinney.  
AIC-150. March 1947. 6 pp. [Processed]

- 100-SBL SOYBEAN PROTEIN. ADHESIVE STRENGTH AND COLOR.  
Allan K. Smith and Herbert J. Max.<sup>1</sup>  
Ind. Eng. Chem. 34(7): 817-820. July 1942.
- 88 \* EXTENDING PHENOLIC RESIN PLYWOOD GLUE WITH  
CORN GLUTEN AND SOYBEAN MEAL.  
Glen E. Babcock and Allan K. Smith.  
AIC-65. November 1944. 6 pp. [Processed]
- 218 \* EXTENDING PHENOLIC RESIN PLYWOOD GLUES WITH  
PROTEINACEOUS MATERIALS.  
Glen E. Babcock and Allan K. Smith.  
Ind. Eng. Chem., Ind. Ed. 39(1): 85-88. January 1947.
- 232 \* EXTENDING RESORCINOL RESIN GLUE WITH CORN GLUTEN.  
Glen E. Babcock and A. K. Smith.  
Mod. Plastics 24(8): 153, 250, 252, 254, 256. April 1947.
- 341 \* USAGE OF SOYBEAN AND PHENOLIC GLUES IN THE SOFTWOOD  
PLYWOOD INDUSTRY.  
Glen E. Babcock and John C. Cowan.  
Soybean Dig. 9(1): 16-17, 45. November 1948.

#### Zein

- 9 \* SOLVENTS FOR ZEIN. PRIMARY SOLVENTS.  
Cyril D. Evans and Ralph H. Manley.  
Ind. Eng. Chem. 33(11): 1416-1417. November 1941.
- 22 \* THE CRITICAL PEPTIZATION TEMPERATURES OF ZEIN IN  
CONCENTRATED ETHYL ALCOHOL.  
Ralph H. Manley and Cyril D. Evans.  
J. Biol. Chem. 143(3): 701-702. May 1942.
- 24 \* STABILIZING ZEIN DISPERSIONS AGAINST GELATION.  
Cyril D. Evans and Ralph H. Manley.  
Ind. Eng. Chem. 35(2): 230-232. February 1943.
- 33 \* PLASTICIZED FILMS FROM ZEIN.  
AIC-12. June 1943. 2 pp. [Processed]
- 35 \* BINARY SOLVENTS FOR ZEIN.  
Ralph H. Manley and Cyril D. Evans.  
Ind. Eng. Chem. 35(6): 661-665. June 1943.
- 60 \* TERNARY SOLVENTS FOR ZEIN.  
Cyril D. Evans and Ralph H. Manley.  
Ind. Eng. Chem. 36(5): 408-410. May 1944.



- 104 \* PREPARATION OF ZEIN BY PRECIPITATION METHOD.  
Cyril D. Evans, R. J. Foster, and C. Bradford Croston.  
Ind. Eng. Chem. 37(2): 175-177. February 1945.
- 160 ZEIN FIBERS...PREPARATION BY WET SPINNING.  
C. B. Croston, C. D. Evans, and A. K. Smith.  
Ind. Eng. Chem. 37(12): 1194-1198. December 1945.
- 261 \* ACETYLATION OF ZEIN FIBERS.  
Cyril D. Evans, C. Bradford Croston, and Cecil VanEtten.  
Textile Research J. 17(10): 562-567. October 1947.
- 368 \* AQUEOUS ZEIN DISPERSIONS.  
C. W. Ofelt and Cyril D. Evans.  
Ind. Eng. Chem. 41(4): 830-833. April 1949.
- 370 \* FORMALDEHYDE CURING OF ZEIN FIBERS.  
Cyril D. Evans and C. Bradford Croston.  
Textile Research J. 19(4): 202-211. April 1949.
- 424 \* STABILIZATION OF ZEIN FILAMENTS. CURING WITH  
FORMALDEHYDE IN ACIDIC NONAQUEOUS MEDIUMS.  
C. Bradford Croston.  
Ind. Eng. Chem. 42(3): 482-484. March 1950.
- 462 \* STABILIZATION OF ZEIN FILAMENTS BY BAKING.  
C. Bradford Croston and Cyril D. Evans.  
Textile Research J. 20(12): 857-858. December 1950.
- 539 A NEW FIBER FROM CORN KERNELS.  
C. Bradford Croston.  
Yearbook Agr., U.S. Dept. Agr.: 469-471. 1950-1951.
- 536 THE INDUSTRIAL USES OF CORN PROTEIN.  
C. Bradford Croston and Cyril D. Evans.  
Yearbook Agr., U.S. Dept. Agr.: 607-610. 1950-1951.
- 518 DIRECT EFFECT OF POLLEN PARENT ON PROTEIN CONTENT  
OF THE CORN KERNEL.  
E. R. Leng,<sup>2</sup> F. R. Earle, and J. J. Curtis.  
Cereal Chem. 28(6): 479-482. November 1951.
- 562 CHEMICAL COMPOSITION OF THE MATURE CORN KERNEL.  
J. A. Cannon, M. M. MacMasters, M. J. Wolf,  
and C. E. Rist.  
Trans. Am. Assoc. Cereal Chemists 10(1): 74-97.  
February 1952.

- 928 A RAPID TURBIDIMETRIC METHOD FOR DETERMINATION  
OF ZEIN.  
E. M. Craine, Carol A. Jones, and Joyce A. Boundy.  
Cereal Chem. 34(6): 456-462. November 1957.
- 930 INFRARED SPECTROSCOPY AND OPTICAL ROTATORY  
DISPERSION OF ZEIN, WHEAT GLUTEN, AND GLIADIN.  
Carl B. Kretschmer.  
J. Phys. Chem. 61(12): 1627-1631. December 1957.
- 935 MODIFICATION OF ZEIN BY DEAMIDATION.  
L. L. McKinney and V. L. Johnsen.  
Trans. Illinois State Acad. Sci. 50: 90-95. 1957.
- 789 \* ZEIN.  
L. L. McKinney.  
In The Encyclopedia of Chemistry (Supplement). G. L.  
Clark, G. G. Hawley, and W. A. Hamor, eds., pp. 319-320.  
New York: 1958.
- 1297 PREPARATION OF PURIFIED ZEIN BY ADSORPTION-DESORPTION.  
E. M. Craine, Diane V. Freimuth, Joyce A. Boundy,  
and R. J. Dimler.  
Cereal Chem. 38(5): 399-407. September 1961.

## PATENTS ON INDUSTRIAL USES OF PROTEINS

1936-1961

[These patents are assigned to the Secretary of Agriculture. Printed copies of patents may be obtained only by purchase (25 cents each) from the Commissioner of Patents, U.S. Patent Office, Washington 25, D.C. Order by number, do not send stamps.]

### THERMOPLASTIC PROTEIN MATERIAL.

George H. Brother and Leonard L. McKinney.  
U.S. Patent 2,238,307. April 15, 1941.

### PROTEIN PLASTIC MOLDING COMPOUND AND METHOD OF PREPARING THE SAME.

George H. Brother and Leonard L. McKinney.  
U.S. Patent 2,262,422. November 11, 1941.

### PROCESS FOR PRODUCING PROTEIN PLASTICS.

George H. Brother and Leonard L. McKinney.  
U.S. Patent 2,309,380. January 26, 1943.

### PROCESS FOR EXTRACTING PROLAMINES.

Ralph H. Manley and Cyril D. Evans.  
U.S. Patent 2,354,393. July 25, 1944.

### PLASTIC COMPOSITION.

R. H. Manley and C. D. Evans.  
U.S. Patent 2,357,839. September 12, 1944.

### PROTEIN PRODUCT AND PROCESS FOR MAKING SAME.

Allan K. Smith, Herbert J. Max, and Donald H. Wheeler.  
U.S. Patent 2,370,266. February 27, 1945.

### PROCESS FOR PREVENTION OF GELATION OF SOLUTIONS OF DISPERSIONS OF PROLAMINES.

Cyril D. Evans and Ralph H. Manley.  
U.S. Patent 2,392,084. January 1, 1946.

### PROCESS FOR OBTAINING INCREASED YIELDS IN THE EXTRACTION OF CORN PROTEINS.

Cyril D. Evans and Chester W. Ofelt.  
U.S. Patent 2,414,195. January 14, 1947.

PLASTICIZED PROLAMINE COMPOSITION.

Ralph H. Manley and Cyril D. Evans.  
U.S. Patent 2,437,946. March 16, 1948.

PROCESS TO PRODUCE A STABILIZED PROTEIN-FORMALDEHYDE DISPERSION.

Leonard L. McKinney.  
U.S. Patent 2,461,070. February 8, 1949.

METHOD OF PRODUCING PROLAMINE FILAMENTS.

Clarence B. Croston and Cyril D. Evans.  
U.S. Patent, 2,478,248. August 9, 1949.

COLD-SETTING RESORCINOL GLUE COMPOSITION AND PROCESS OF PREPARATION.

Glen E. Babcock and Allan K. Smith.  
U.S. Patent 2,494,537. January 17, 1950.

N-(2-CYANOETHYL)-2-PYRROLIDONE-5-CARBOXYLIC ACID AND METHODS FOR ITS PREPARATION.

Leonard L. McKinney, Eugene H. Uhing, and John C. Cowan.  
U.S. Patent 2,517,585. August 8, 1950.

FIBERS FROM ZEIN.

Cyril D. Evans, Chester W. Ofelt, and Allan K. Smith.  
U.S. Patent 2,521,704. September 12, 1950.

CURING PROLAMINE FIBERS WITH ALDEHYDE IN LIQUID ORGANIC MEDIUM.

Clarence B. Croston, Cyril D. Evans, Leonard L. McKinney, and John C. Cowan.  
U.S. Patent 2,524,042. October 3, 1950.

BETA-CYANOETHYL DERIVATIVES OF AMINO ACIDS AND PROCESS FOR PREPARING THEM.

Leonard L. McKinney, John C. Cowan, and Eugene H. Uhing.  
U.S. Patent 2,538,024. January 16, 1951.

FIBERBOARD CONSTRUCTION

Glen E. Babcock, Vernon L. Johnsen, and Allan K. Smith.  
U.S. Patent 2,580,391. January 1, 1952.

ACRYLONITRILE PROTEIN DERIVATIVES.

John C. Cowan, Cyril D. Evans, and Leonard L. McKinney.  
U.S. Patent 2,594,293. April 29, 1952.

METHOD OF BONDING USING HEAT SEALING PROTEIN ADHESIVES.

Arthur C. Beckel, John C. Cowan, and Paul A. Belter.  
U.S. Patent 2,600,388. June 17, 1952.

N,2-CARBOALKOXYETHYL DERIVATIVES OF ALPHA-AMINO ACIDS  
AND OF ACYLATED ALPHA-AMINO ACIDS.

Leonard L. McKinney, Eugene H. Uhing, Eugene A. Setzkorn,  
and John C. Cowan.

U.S. Patent 2,607,797. August 19, 1952.

SKIN CLEANING COMPOSITIONS.

Leonard L. McKinney and John C. Cowan.

U.S. Patent 2,610,153. September 9, 1952.

PREPARATION OF PROTEINACEOUS SOYBEAN MATERIAL  
USING ISOPROPANOL.

Paul A. Belter, Allan K. Smith, Harold J. Deobald,  
Philip A. Singer, and Arthur C. Beckel.

U.S. Patent 2,635,094. April 14, 1953.

PROTEIN ADHESIVES.

Arthur C. Beckel and Paul A. Belter.

U.S. Patent 2,668,766. February 9, 1954.

CONDENSATION PRODUCTS OF  $\alpha$ -AMINO ACIDS AND PHENOLS.

Leonard L. McKinney, Eugene A. Setzkorn, and  
Eugene H. Uhing.

U.S. Patent 2,717,263. September 6, 1955.

CARBOXYMETHYL PROTEIN AS A STABILIZER FOR A  
BUTADIENE-STYRENE LATEX EMULSION PAINT.

Eugene Henry Uhing and Leonard L. McKinney.

U.S. Patent 2,788,336. April 9, 1957.

NOVEL HYDANTOIC ACIDS AND THEIR ALKYL ESTERS.

Leonard L. McKinney.

U.S. Patent 2,829,157. April 1, 1958.

S-(1,2-DICHLOROVINYL)-GLUTATHIONE AND METHOD  
FOR ITS PREPARATION.

Arthur C. Eldridge and Leonard L. McKinney.

U.S. Patent 2,849,434. August 26, 1958.

S-(1,2-DICHLOROVINYL)-CYSTEINE AND METHOD  
FOR ITS PREPARATION.

Leonard L. McKinney, Frances B. Weakley,  
and Arthur C. Eldridge.

U.S. Patent 2,890,246. June 9, 1959.



